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December 5, 2011

Raymond Sharp
Director of Environmental Services
City of Leesburg
PO Box 490630
Leesburg, Florida 34749

Reference: ***Geotechnical Exploration***
Leesburg Sinkhole
NEC of Crosby Street and East Street
Leesburg, Florida
Universal Project No. 0830.1100450.0000

Dear Mr. Sharp:

Universal Engineering Sciences, Inc. completed a geotechnical exploration to determine the influence of a sinkhole affecting City of Leesburg right-of-way and the findings of our exploration were presented in our report dated July 13, 2011.

On June 27, 2011 a sinkhole formed at the commercial building located at the southeast corner of Main Street and S. East Street in Leesburg, Florida. The width of the sinkhole was approximately 70 feet and a portion of the sinkhole caused damage to the Crosby street.

Our exploration consisted of a ground penetrating radar (GPR) survey that took place on June 27, 2011 and two (2) standard penetration test (SPT) borings, B-1 and B-2. Significant observations made during the time of drilling operations were very loose to loose sand that was encountered from 20 to 35 ft bls in boring B-2.

Based on the findings of the GPR and subsurface data obtained from our SPT Borings, Universal concluded that the zone of influence of the sinkhole most likely extends the width of Crosby Street. Very loose zones of material were encountered in boring B-1 and B-2 between 20 to 35 ft bls. These loose zones have likely occurred due to the sinkhole. Recommendations to stabilize the soils within the Crosby Street right-of-way affected by the sinkhole included treating the soils beneath Crosby Street with low slump compaction grout. The grout injection pipes should be spaced on 10 foot centers on Crosby Street. The grouting pipes should be inserted to the top of relatively hard limestone. We estimated this depth to be approximately 50 to 55 ft bls. Within heavily weathered limestone areas, grout injection pipes may be installed deeper at the discretion of the Geotechnical Engineer.

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Preliminarily, we estimated a total of 24 grout injection points with a total of 1300 lineal ft of grout injection point piping and approximately 200 to 250 cubic yards of low slump grout. This quantity could vary dependent upon actual conditions at locations other than the borings.

Since our report was issued we understand the property owner has filled in the sinkhole with some compactive effort. The reason for the compaction grout was to restore the subgrade soils beneath the right-of-way for Crosby Street to conditions prior to the sinkhole collapse and provide stability while the sinkhole was repaired. Now that the sinkhole has been filled, another option other than grouting can be considered. We recommend as an alternative to grouting that the asphalt and base materials be removed and the right-of-way be compacted with a vibratory roller densifying the upper 2 feet to Leesburg City Standards. The compaction should be done prior to repairing the utilities within the right-of-way. In addition, care should be taken not to damage any adjacent structures during the vibratory roller compaction. The base and asphalt should then be placed in accordance with Leesburg City Standards. This option provides a cost effective measure to repair the distress to the right-of-way for Crosby Street, compaction grouting is an effective method in repairing the deep subsurface conditions that may affect long term maintenance of the Right-Of-Way for Crosby Street.

We appreciate the opportunity to have assisted you. Please contact us if you have any questions or if we may further assist you.

Respectfully submitted,

UNIVERSAL ENGINEERING SCIENCES, INC.
Certificate of Authorization No. 549/GB33

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Tampa Branch Manager
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Date: 12/5/2011

Mark Hardy, P.E.
Regional Manager
Professional Engineer No. 57233
Date: 12/5/2011